

# Azure Storage

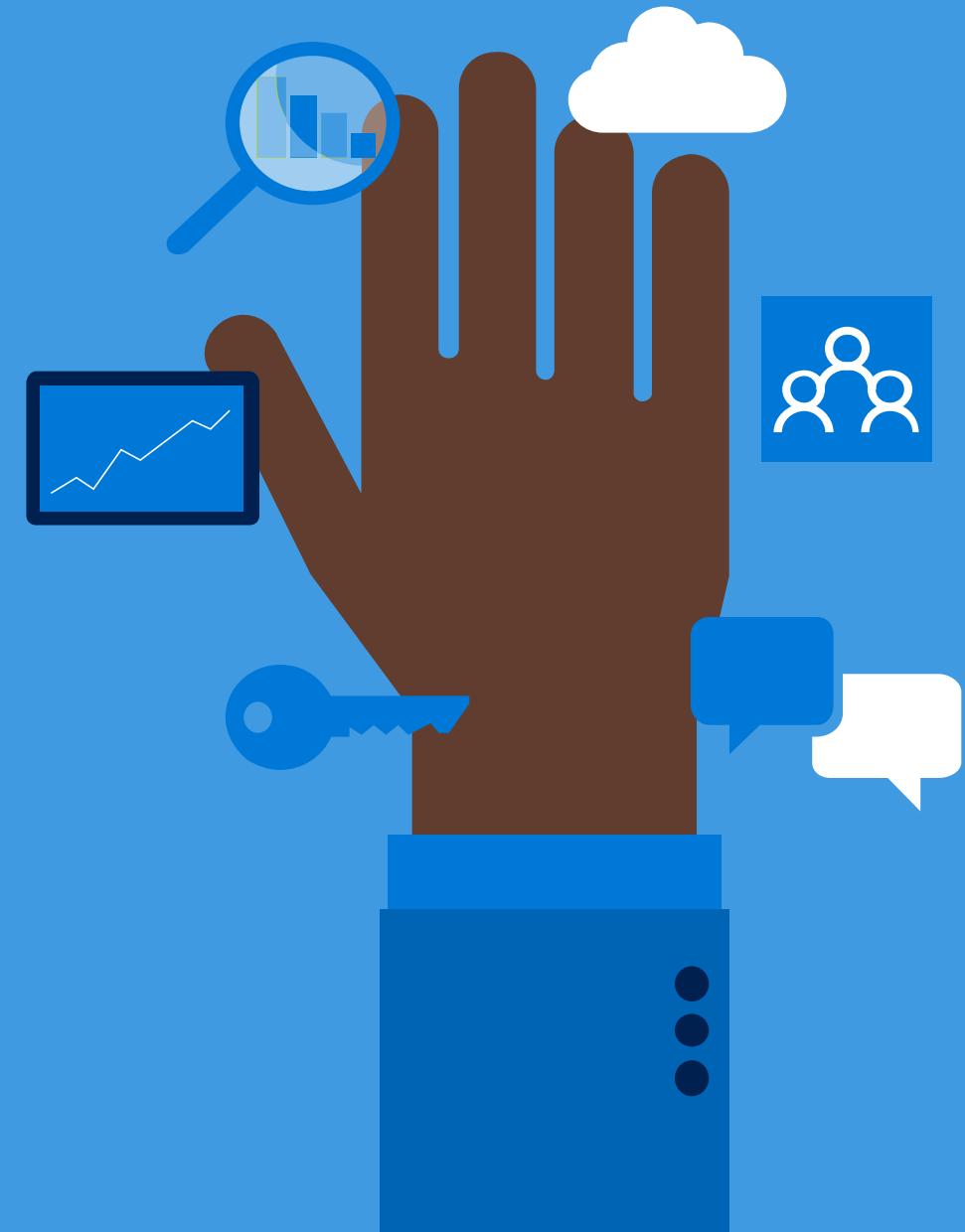
Joe Losinski  
Partner Technology Strategist



# What will we accomplish?

## Purpose of this workshop

- Describe Azure Storage
- Develop the foundational Azure Storage design



# High-level agenda

- Azure Storage overview
- Storage offerings
- Storage availability and redundancy
- Storage performance
- Storage management
- Storage deployment models
- Key decisions
- Next steps

# Storage overview

# Azure Storage Services

IaaS	PaaS			
 Storage	 Existing frameworks			
 Virtual machines	 Web and mobile			
 Networking	 Microservices			
	 Serverless Compute			
<h2>Disks</h2> <p>Persistent disks for Azure IaaS VMs</p> <p>Standard Storage Disks: Magnetic disk based, low IOPS, moderate latency</p> <p>Premium Storage Disks: SSD based, high IOPS, low latency</p> <p>Managed Disks</p>	<h2>Files</h2> <p>Fully Managed File Shares in the Cloud</p> <p>SMB and REST access</p> <p>"Lift and shift" legacy apps</p>	<h2>Blobs</h2> <p>Highly scalable, REST based cloud object store</p> <p>Block Blobs: Sequential I/O, Hot, Cool and Archive Tiers</p> <p>Page Blobs: Random-write pattern data</p> <p>Append Blobs</p>	<h2>Tables</h2> <p>Massive auto-scaling NoSQL store</p> <p>Dynamic scaling based on load</p> <p>Scale to PBs of table data</p> <p>Fast key/value lookups</p>	<h2>Queues</h2> <p>Reliable queues at scale for cloud services</p> <p>Decouple and scale components</p> <p>Message visibility</p> <p>timeout and update message to protect against unreliable dequeuers</p>

**Built on a unified Distributed Storage System**

Durability, Encryption at Rest, Strongly Consistent Replication, Fault Tolerance, Auto Load-Balancing

# What is the Blob Storage Service?

Azure's Object Storage platform

Store and serve unstructured data

- App and Web scale data

- Backups and Archive

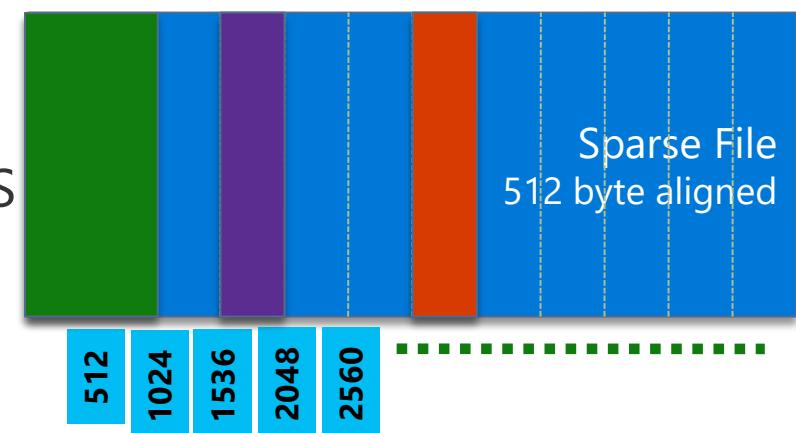
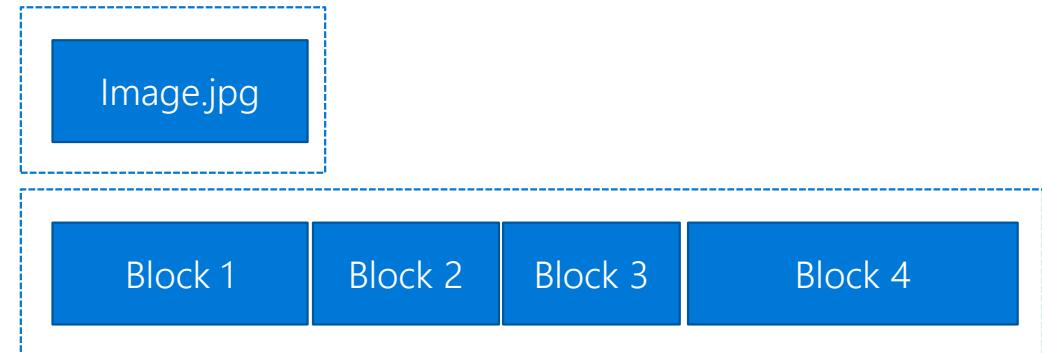
- Big Data from IoT, Genomics, etc.

## Types of Blobs

Block Blobs - Most object storage scenarios

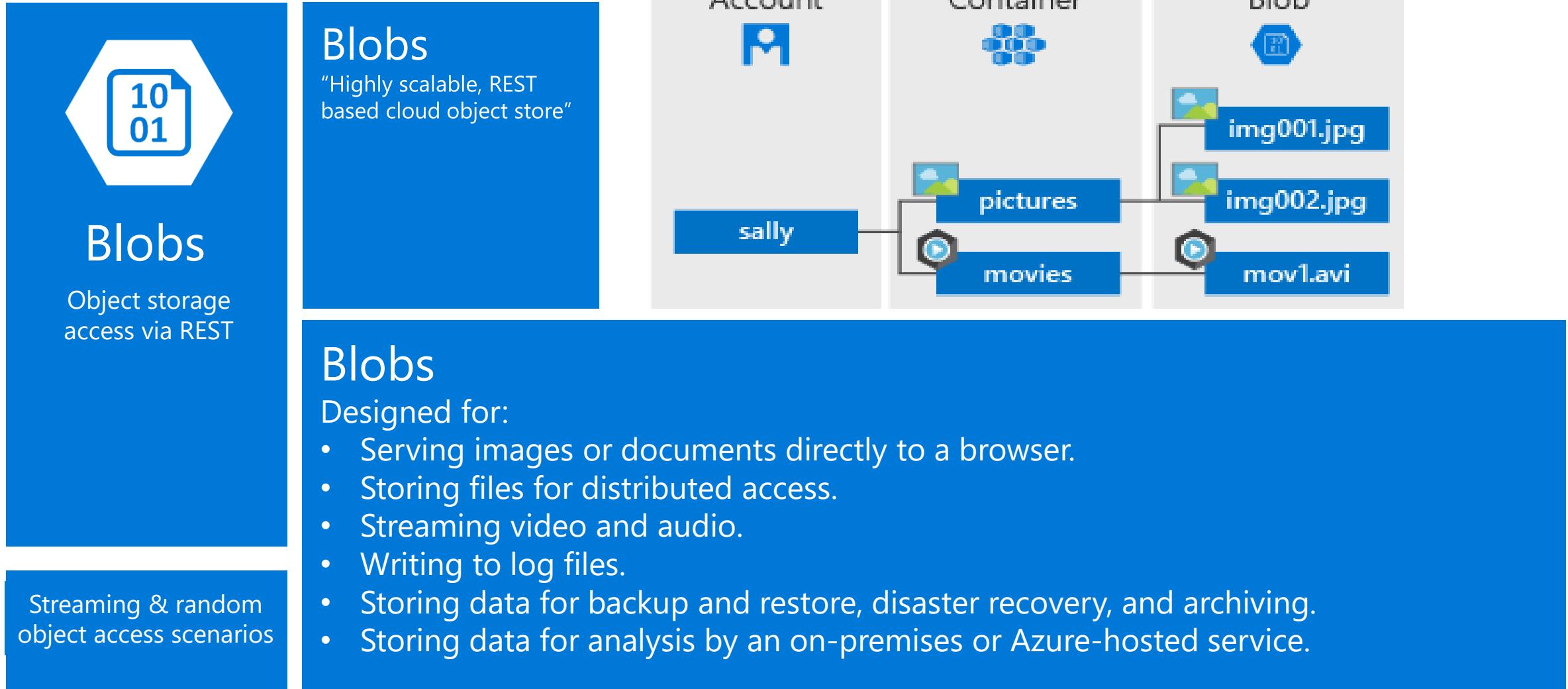
Append Blobs - Multi-writer append only scenarios

Page Blobs - Page aligned random reads and writes

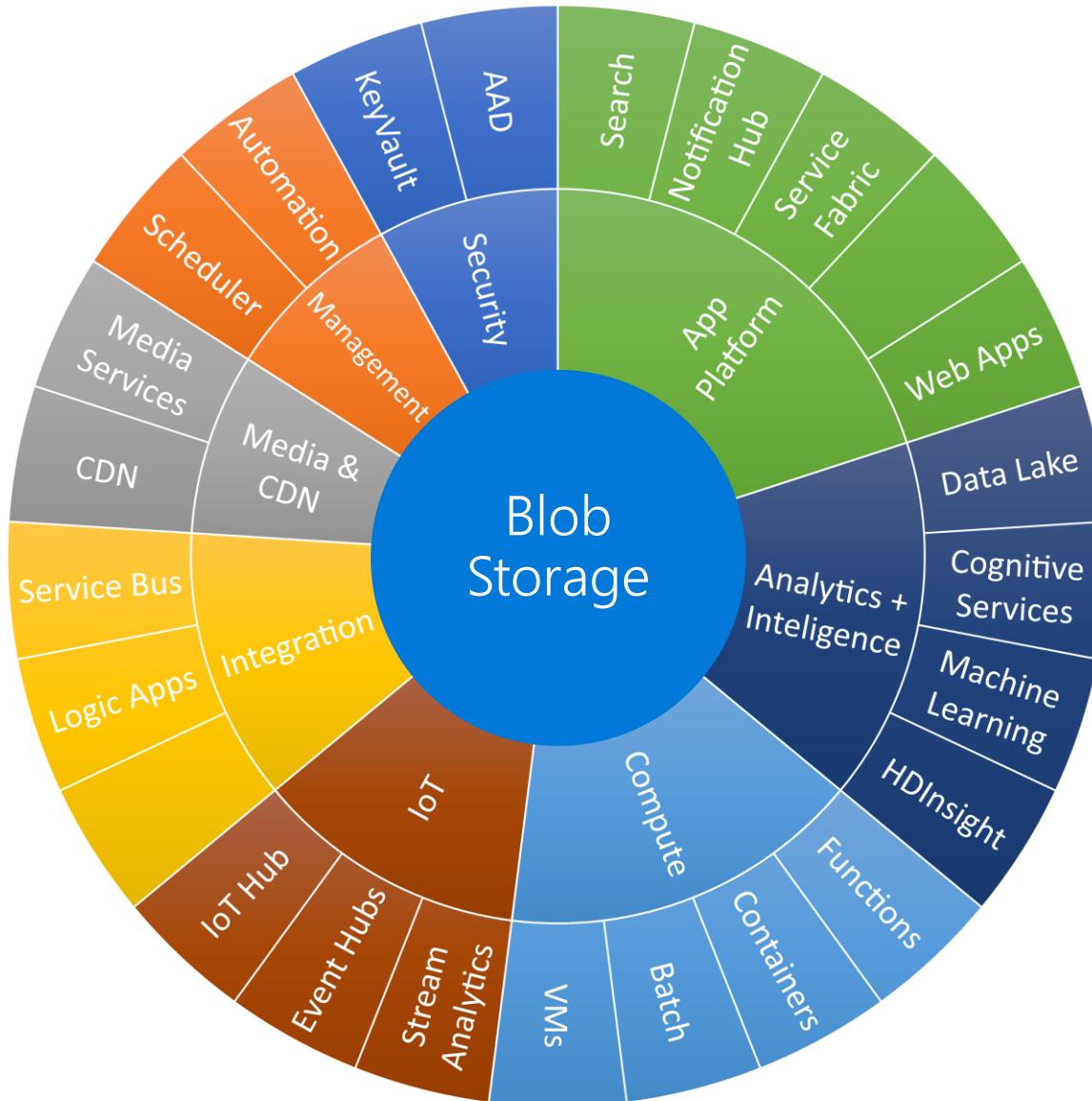


# Azure Blob storage overview

Blob storage offers three types of resources:



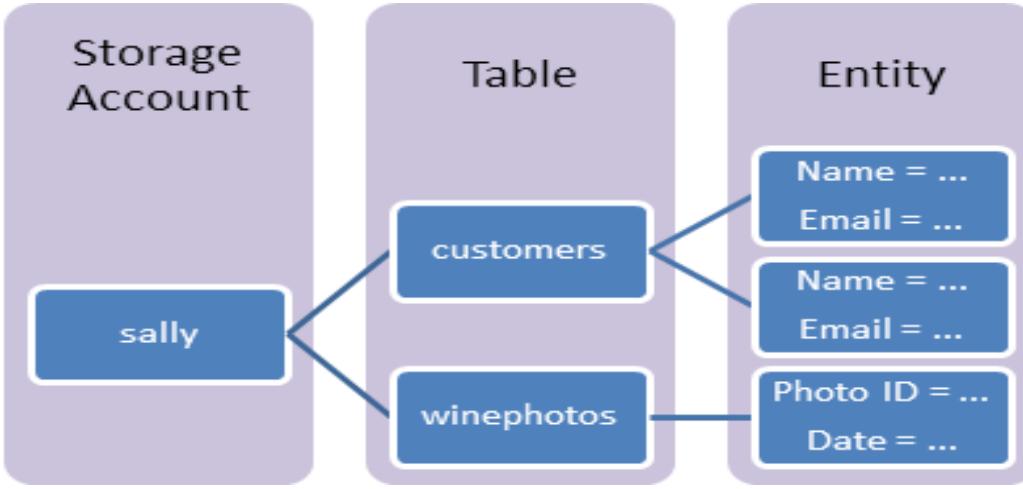
# Azure Ecosystem and Blob Storage



Broad integration for Blobs  
across Azure services

# Azure Table Storage overview

Table storage contains the following components:



## Tables

NOSQL storage  
access via REST

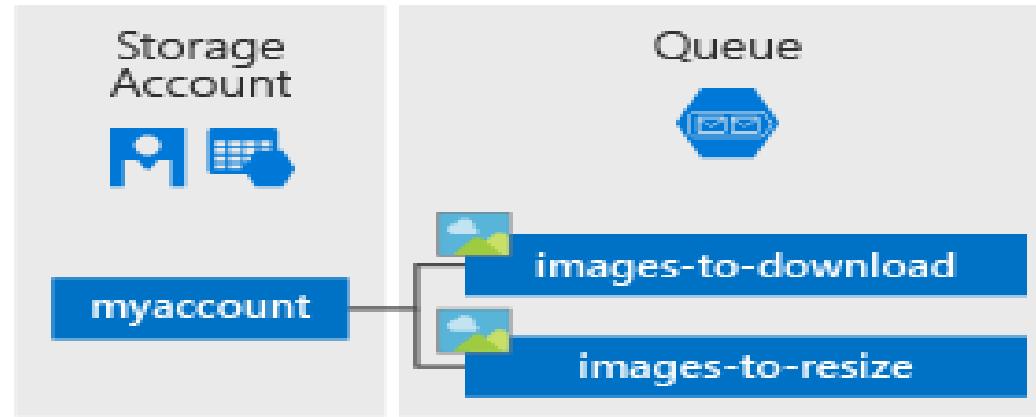
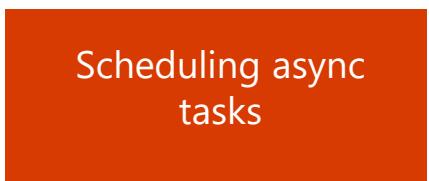
## Tables

Azure Table storage is a service that stores structured NoSQL data in the cloud, providing a key/attribute store with a schemaless design.

You can use Table storage to store flexible datasets like user data for web applications, address books, device information, or other types of metadata your service requires. You can store any number of entities in a table, and a storage account may contain any number of tables, up to the capacity limit of the storage account.

## KeyValue Store

# Azure Queues overview



**Queues**

Azure Queue storage is a service for storing large numbers of messages that can be accessed from anywhere in the world via authenticated calls using HTTP or HTTPS.

Common uses of Queue storage include:

- Creating a backlog of work to process asynchronously
- Passing messages from an Azure web role to an Azure worker role

# Azure Files overview

10  
01

## Files

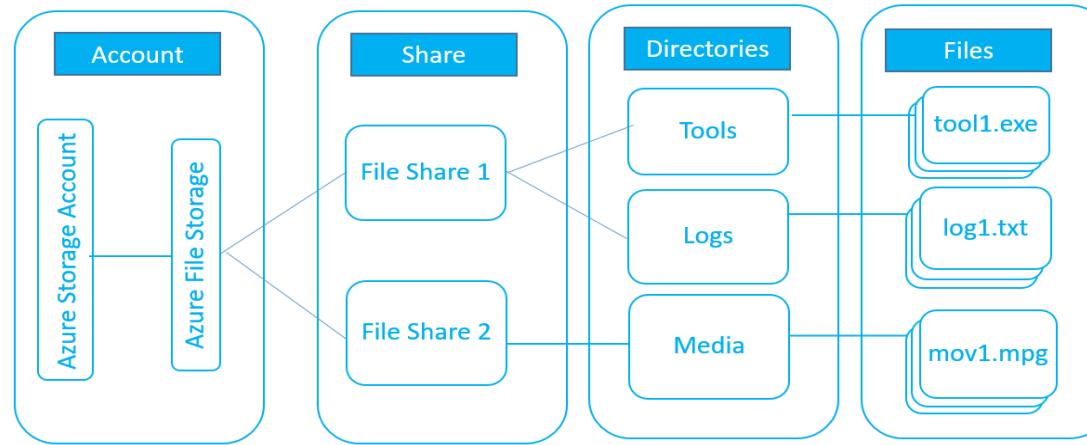
File storage access via SMB, REST

Lift-n-shift scenarios

### Files

"SMB access to Azure Storage"

Azure Files management constructs:



## Files

Azure Files offers fully managed file shares in the cloud that are accessible via the industry standard Server Message Block (SMB) protocol.

- Replace or supplement on-premises file servers
- Makes it easy to "**lift and shift**" applications to the cloud that expect a file share to store file application or user data
- Natively supported by OS APIs, libraries, and tools
- Built on SMB2.1, works with Windows and Linux
- No limits on number of shares; 5TB and 1000 IOPS per share

# Azure Disks

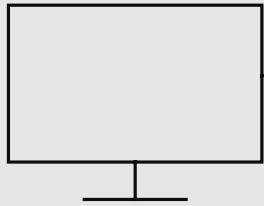
## Performance tiers



**Premium SSD Disks**  
Provisioned performance  
for Enterprise Prod



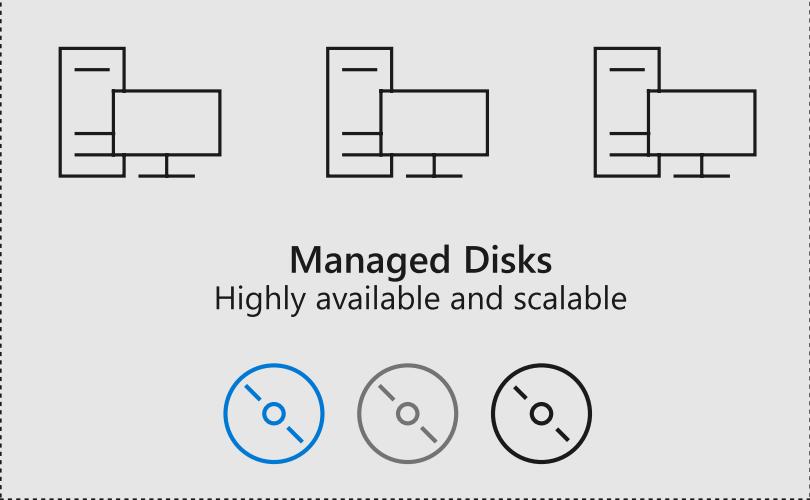
**Standard SSD Disks**  
Cost effective performance  
for entry-level workloads



**Standard HDD Disks**  
HDD based, cost effective  
for dev-test workloads

## Simplified management

Resource Group



**Industry leading ZERO%**  
**annual failure rate**

Enterprise grade durability  
with 3 replicas

**Best in class VMs with**  
**high IOPS/BW**

80,000 IOPS & 2,000 MB/s  
Disk throughput per VM

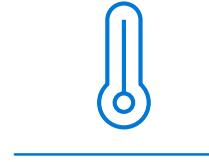
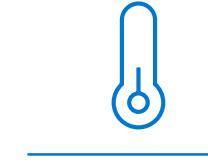
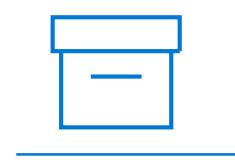
**< 1ms latency for cached**  
**operations**

Blob Cache technology  
Up to 160,000 IOPS

**Developer support**

REST API support  
Easy migration/DR backup  
Rich partner ecosystem

# Object storage for every use case

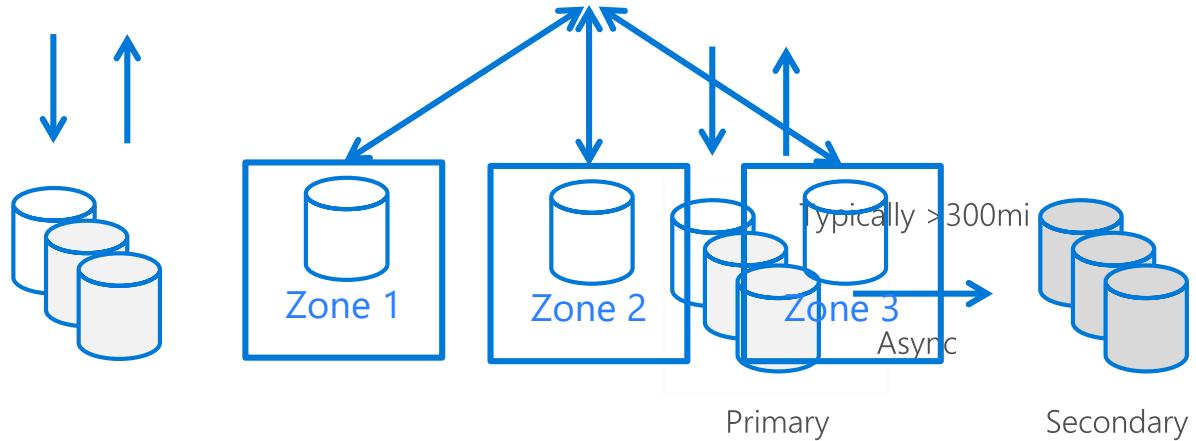
Azure Blob	 Hot	 Cool	 Archive
	Frequently accessed data	Less frequently accessed data	Rarely accessed data
 Per TB per month	\$20.80	\$15.20	\$0.99
 Per 10k write operations	\$0.05	\$0.10	\$0.10
 Retrieval times	Immediate	Immediate	Hours
Use cases	Cloud native application data storage	Repository for server backups	Medical records archiving

# Scalability & performance roadmap

	Standard HDD Managed Disks	Standard SSD Managed Disks	Premium SSD Managed Disks
Disk latency	Double digit millisecond	Single digit millisecond	Uncached Read: ~4ms Uncached Write: ~2ms -> ~1ms (Q3 CY2018)
Max disk size	4TB -> 32TB (H2 CY18)	4TB -> 32TB (H2 CY18)	4TB -> 32TB (H2 CY18)
Max disk IOPS	500 IOPS	500 IOPS	7,500 IOPS
Max disk bandwidth	60 MBps	60 MBps	250 MBps

\* The disk performance target is subject to change

# Storage redundancy models



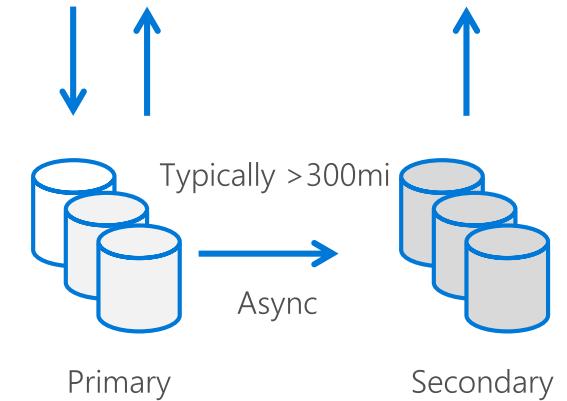
## Locally-redundant storage (LRS)      Geo-redundant storage (ZRS) v2 storage (GRS)

3 replicas, 1 region      3 replicas **across 3 Zones**      3 replicas, 2 regions

Protect against disk, node, rack  
node, rack failures      Protect against disk, node, rack  
and **zone** failures      ( $3/region$ )

Write is ack'd when all **Synchronous writes** to all 3  
replicas are committed      Protects against major  
regional disasters

Superior to dual-parity  
RAID      Asynchronous to secondary



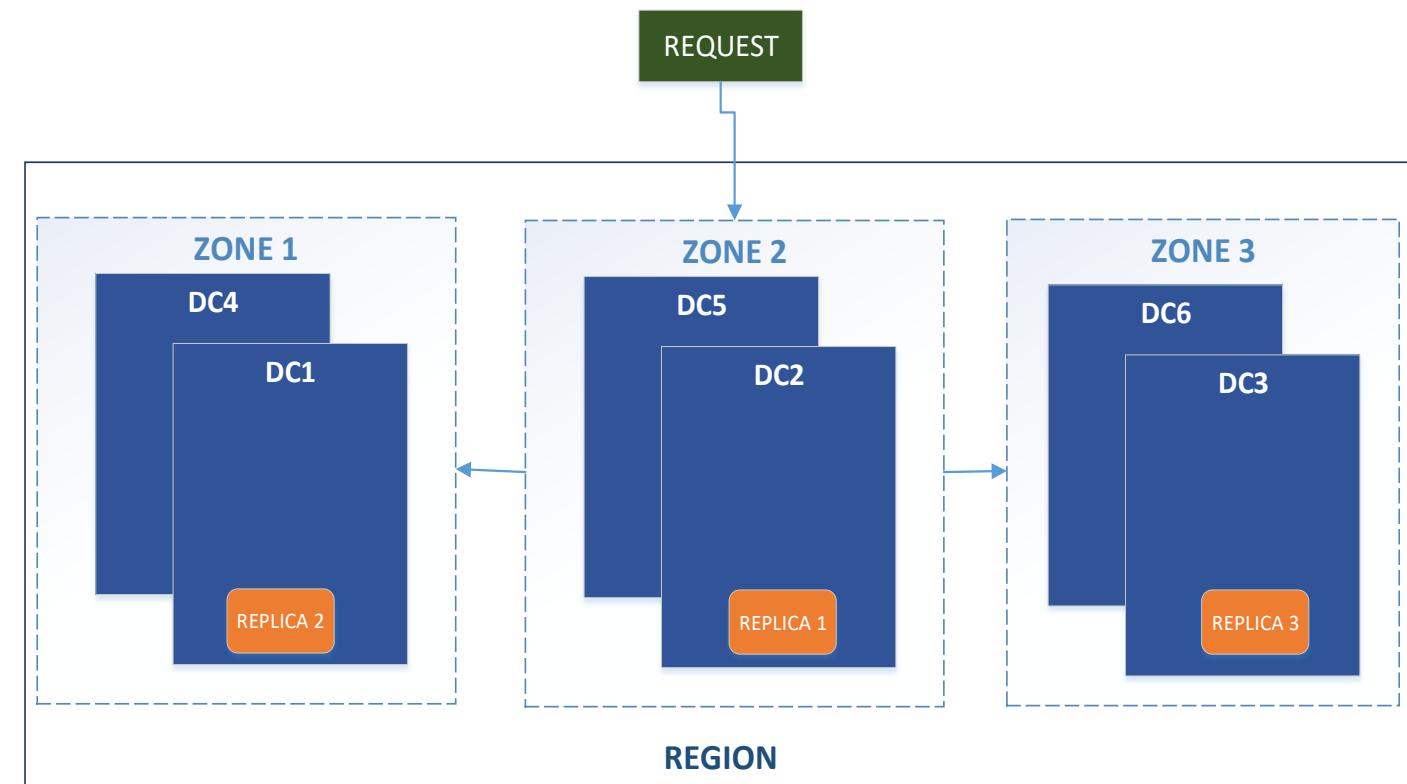
## Read-access Geo-redundant storage (RA-GRS)

GRS + Read access to  
secondary

Separate secondary  
endpoint

RPO delay to secondary can  
be queried

# Azure Zone Redundant Storage (ZRS)



Read / write resilience against single cluster / DC unavailability

Support for Blob, Table, File, Queue Storage

## LRS

Resilient to disk/node/rack failures

## ZRS

Resilient to single cluster / datacenter outage

## GRS

Resilient to regional outage

## RA-GRS

Resilient to regional outage  
Read access to second region

# Paired regions

Geography	Paired regions	
Asia	East Asia	Southeast Asia
Australia	Australia East	Australia Southeast
Australia	Australia Central	Australia Central 2
Brazil	Brazil South	South Central US
Canada	Canada Central	Canada East
China	China North	China East
China	China North 2	China East 2
Europe	North Europe	West Europe
France	France Central	France South
Germany	Germany Central	Germany Northeast
India	Central India	South India
India	West India	South India
Japan	Japan East	Japan West
Korea	Korea Central	Korea South
North America	East US	West US
North America	East US 2	Central US
North America	North Central US	South Central US
North America	West US 2	West Central US
UK	UK West	UK South
US Department of Defense	US DoD East	US DoD Central
US Government	US Gov Arizona	US Gov Texas
US Government	US Gov Iowa	US Gov Virginia
US Government	US Gov Virginia	US Gov Texas

<https://docs.microsoft.com/en-us/azure/best-practices-availability-paired-regions>

# Types of storage accounts

Storage account type	Supported services	Supported performance tiers	Supported access tiers	Replication options	Deployment model	Encryption
General-purpose V2	Blob, File, Queue, Table, and Disk	Standard, Premium	Hot, Cool, Archive	LRS, GRS, RA-GRS, ZRS, ZGRS (preview) <sup>4</sup> , RA-ZGRS (preview)	Resource Manager	Encrypted
General-purpose V1	Blob, File, Queue, Table, and Disk	Standard, Premium	N/A	LRS, GRS, RA-GRS	Resource Manager, Classic	Encrypted
Block blob storage	Blob (block blobs and append blobs only)	Premium	N/A	LRS	Resource Manager	Encrypted
FileStorage	Files only	Premium	N/A	LRS	Resource Manager	Encrypted
Blob storage	Blob (block blobs and append blobs only)	Standard	Hot, Cool, Archive	LRS, GRS, RA-GRS	Resource Manager	Encrypted

# Storage access control strategies

## Multiple access control strategies

- Storage account key – Full access
- Shared access signature (SAS) – Token with configurable rights and time
- Public – Blob storage only

## Shared access signature

- Resources – Account (coming soon), containers, Blobs, queues, tables, table ranges
- Permissions – Read, write, delete, etc.
- Time – Start time, end time

```
https://storageaccount.blob.core.windows.net/sascontainer?sv=2012-02-12&se=2013-04-13T00%3A12%3A08Z&sr=c&sp=w&sig=t%2BbzU9%2B7ry4okULN9S0wst%2F8MCUhTjrHyV9rDNLSe8g%3Dsss
```

# Azure Files and Azure file Sync

# What is Azure Files?

Cloud file shares that are...



Easily managed

No servers required



Secure

Data encrypted at rest and in transit



Cross-platform

Mount on Windows, Linux, and macOS

Protocols: *SMB 2.1, 3.0, and REST*



Built for a hybrid world

Access data where you want to,  
how you want to



Smart

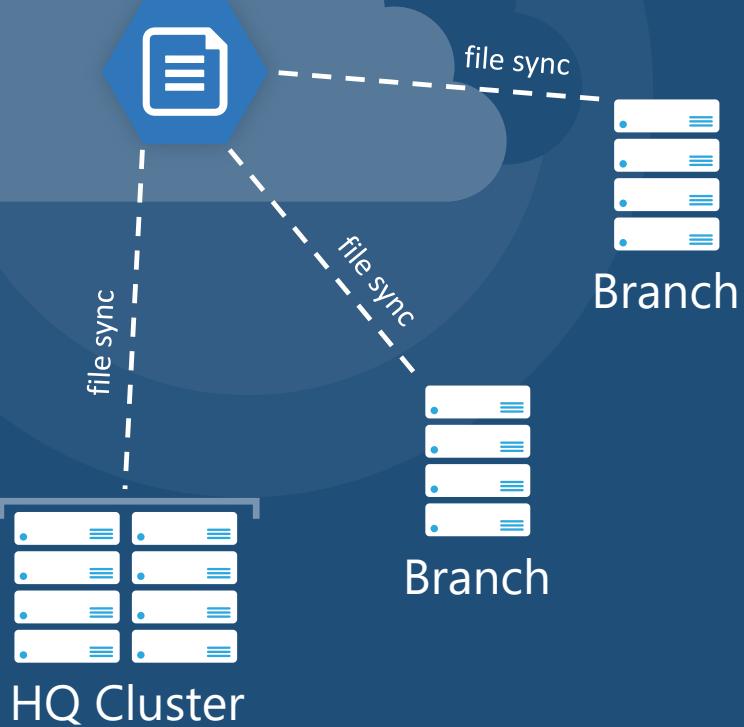
Make the most of limited networks  
with intelligent caching



Harmonious

Migrate applications to the cloud  
without the headaches

# Azure File Sync



Centralize file services in Azure storage

Cache in multiple locations for fast, local performance

Utilize cloud-based backup and fast DR

Maintain on-prem compatibility

# Azure File Sync - Scenarios

Multi-site sync

Keep a data set in sync across multiple locations

Cloud tiering

Cloud tiering is an optional feature of Azure File Sync in which frequently accessed files are cached locally on the server while all other files are tiered to Azure Files based on policy settings. It turns a server into a lightweight, disposable, performance cache for Azure Files

Direct cloud access

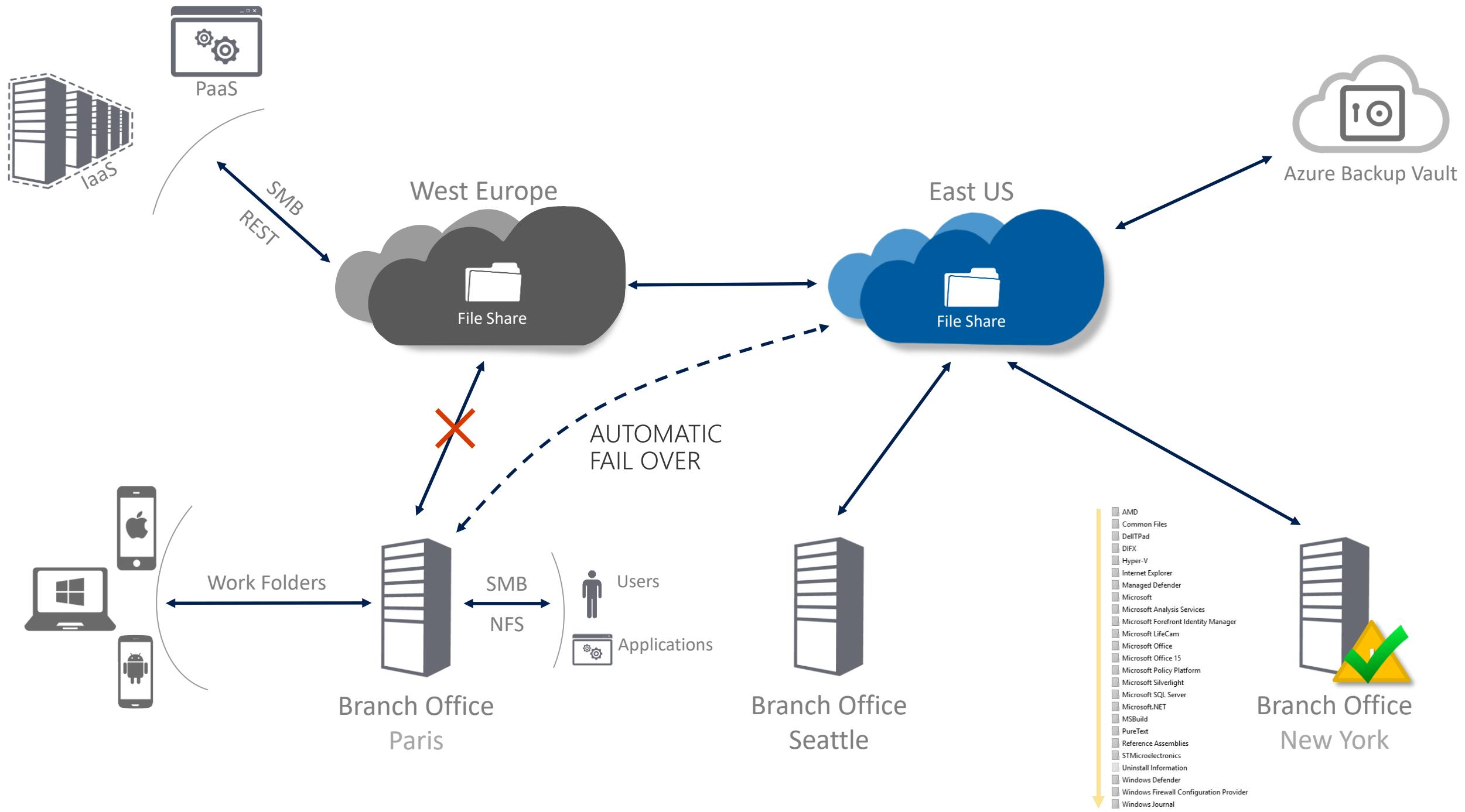
Native file format with SMB and REST access

Integrated cloud backup

Point-in-time recovery and retention policies without redundant data transfer

Rapid file server DR

Fast namespace sync with no need to wait for data restore



# Managed Disks

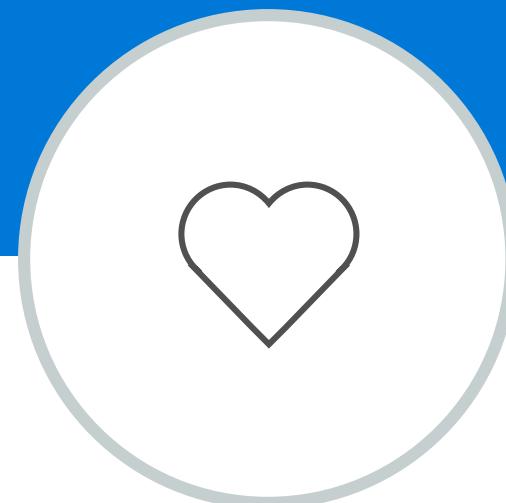
# Azure Managed Disks Benefits

Best value persistent storage for your business critical workloads



## Secure by Default

Encryption at Rest  
Granular RBAC



## Highly Available

Prevents single  
points of failure due  
to storage



## Simple

No operational  
costs for disk  
management



## Big Scale

50,000 disks per region per  
subscription  
No throttling due to storage  
account IOPS limits

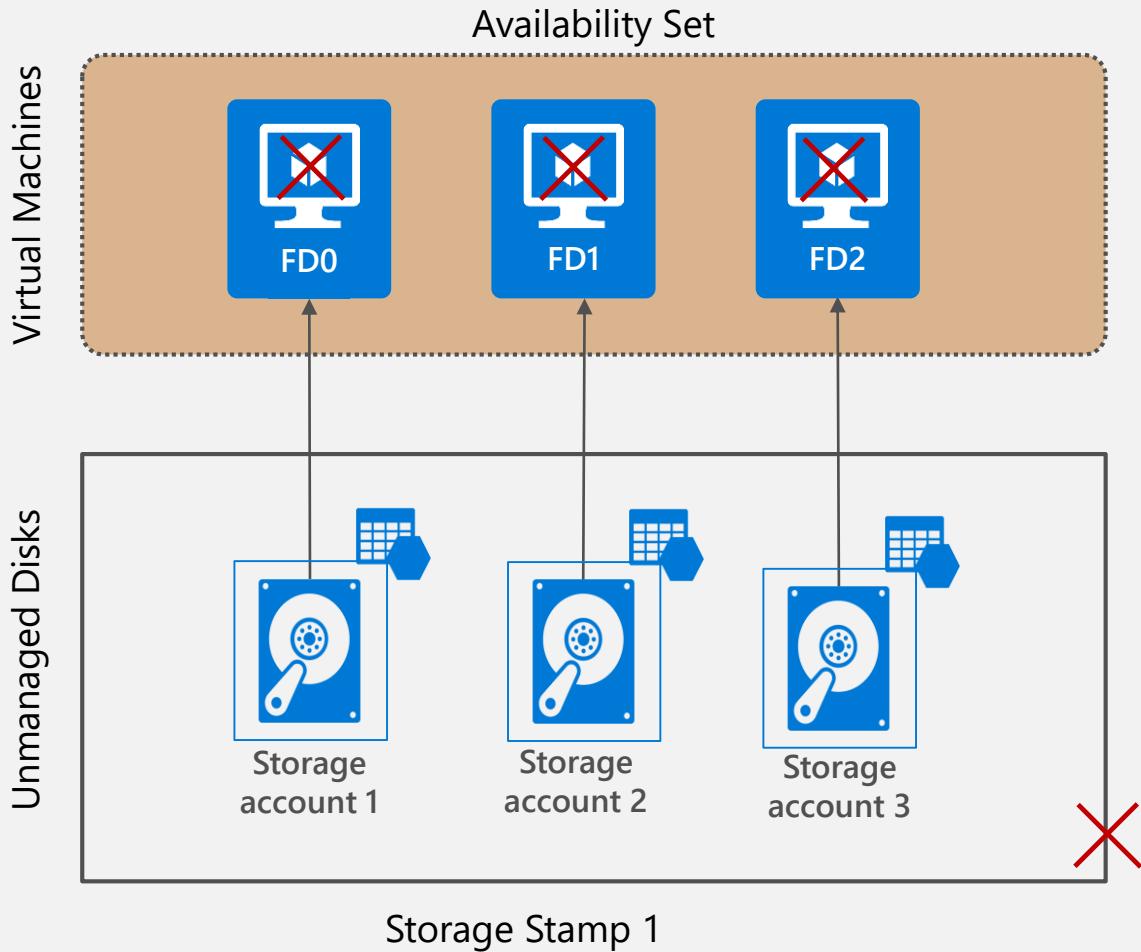
# Managed Disks Security

## Managed Disks are Secure by Default

- Managed disks provide granular Role-based Access Control for your disks
- Storage Service Encryption by default
- Azure Disk Encryption using your own keys



# VM Availability with Unmanaged Disks

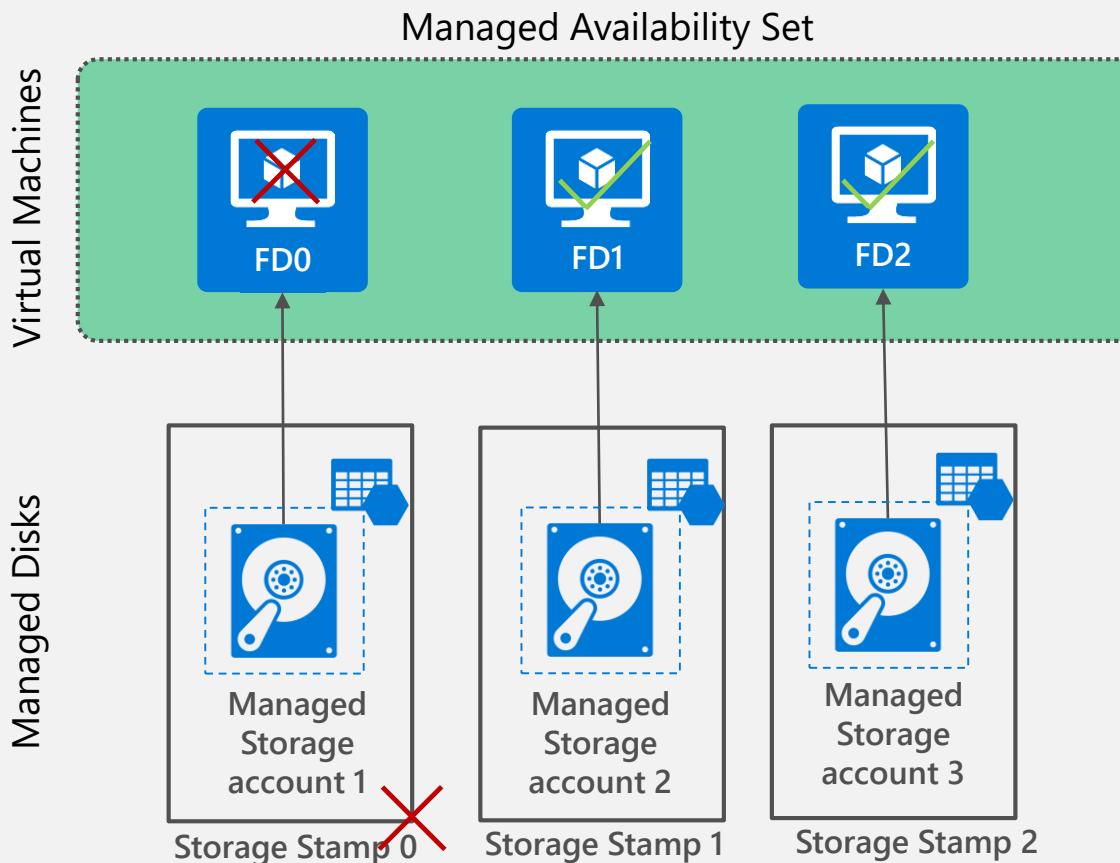


Azure Availability Sets protect Virtual Machines from compute related outages



Unmanaged disks do not protect against single storage scale unit outages

# VM Availability with Managed Disks

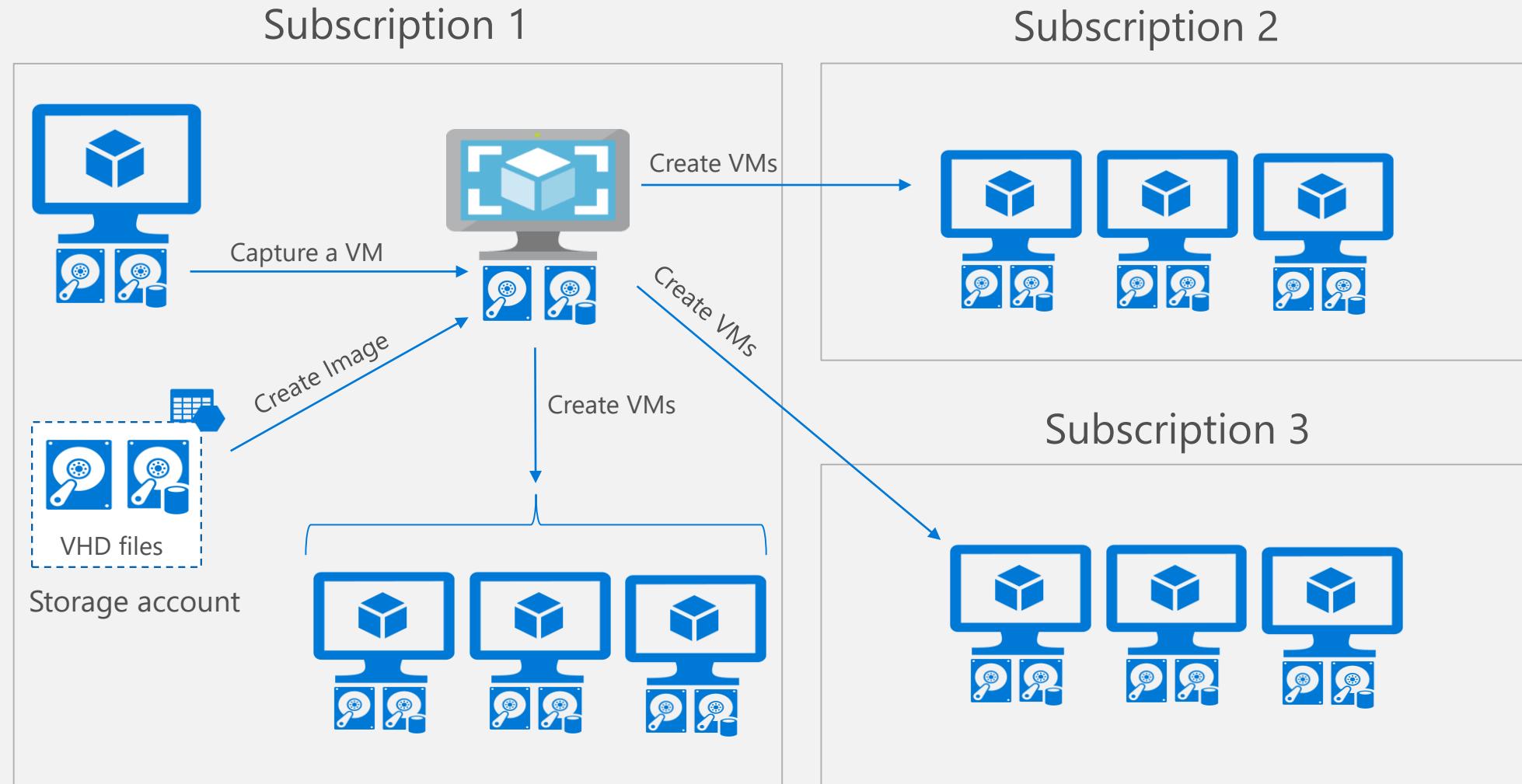


Managed Availability Sets protect Virtual Machines from compute related outages



Managed disks protect against single storage scale unit outages

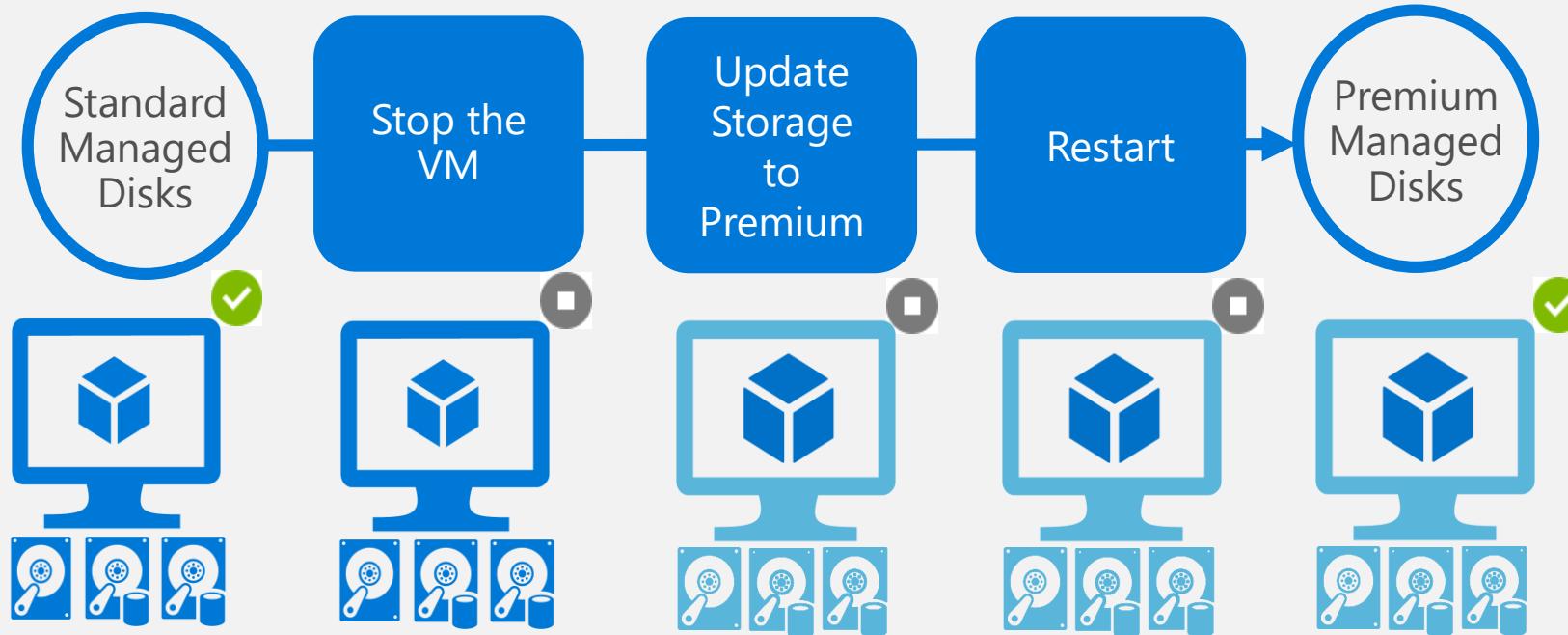
# Reusable Custom Images across subscriptions



# Unmanaged – Complex upgrade from Standard to Premium



# Managed – Easy upgrade from Standard to Premium



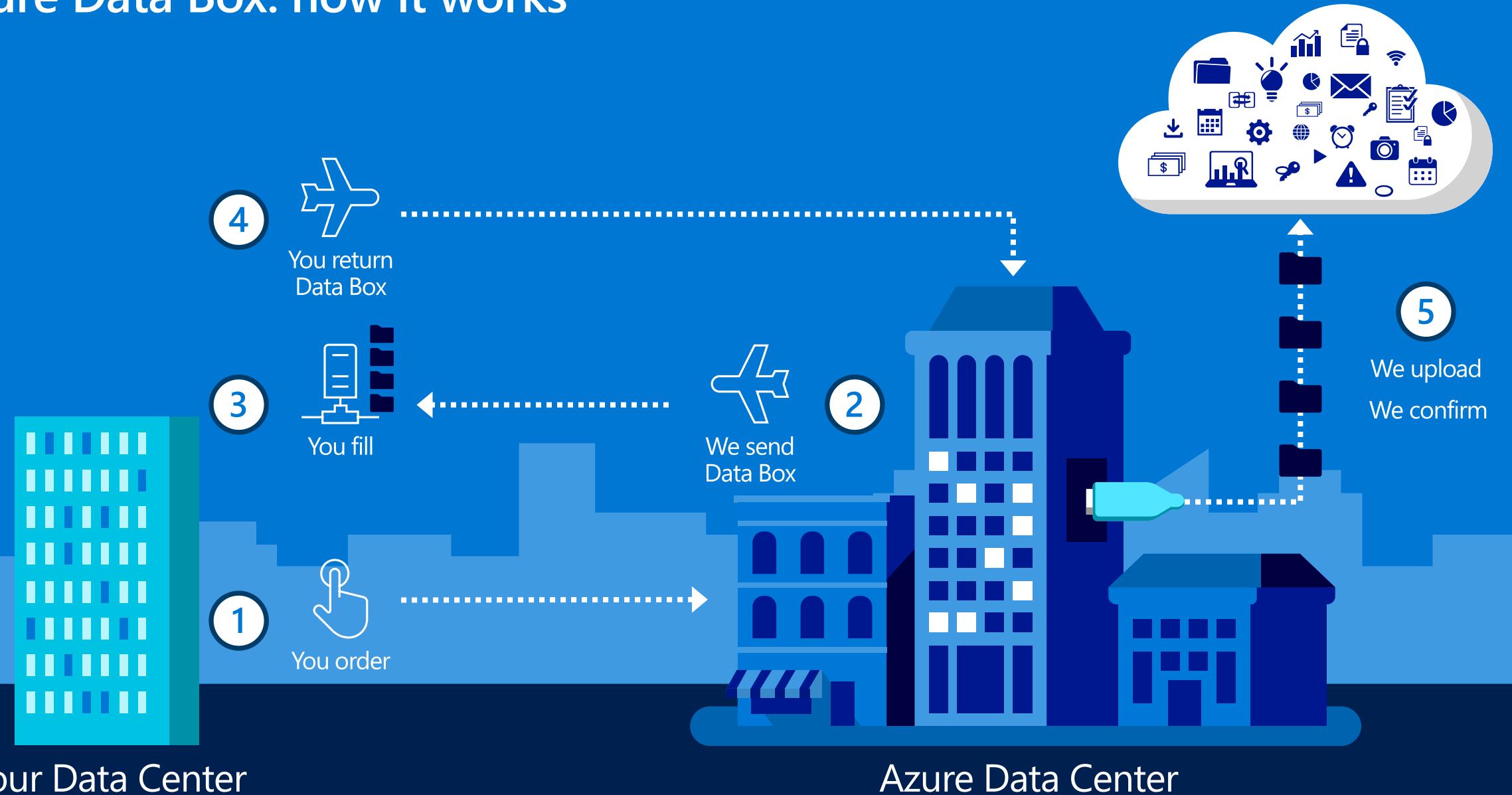
- 😊 < 5 minutes downtime
- 😊 Downtime only for reboot
- 😊 No manual data copy
- 😊 Single click upgrade

# Data at the edge

## Moving data from the edge into Azure with the Data Box family



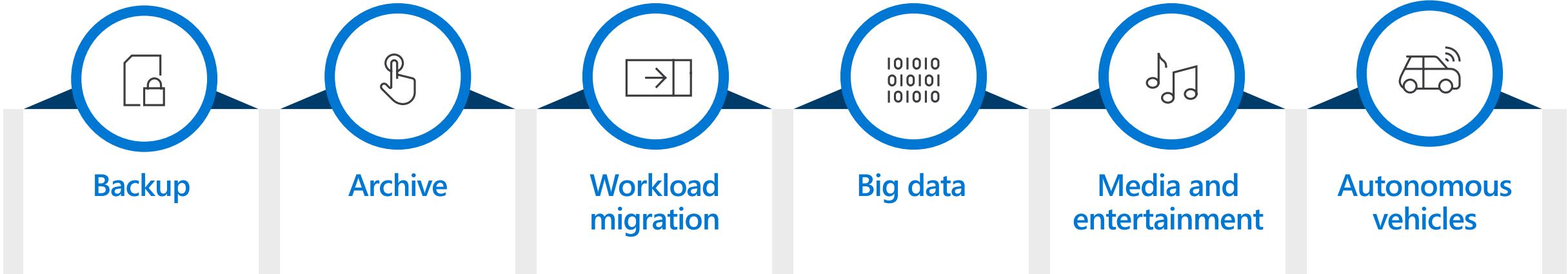
# Azure Data Box: how it works



# Data at the edge

Data Box online appliances empower cloud data management

## SCENARIOS



# Data Box offline device selection

Data qty	45 Mbps (T3)	100 Mbps	1 Gbps	10 Gbps	Key
1 TB	2 days	1 day	2 hours	14 minutes	Use the network
10 TB	22 days	10 days	1 day	2 hours	Use Data Box Disk
35 TB	76 days	34 days	3 days	8 hours	Use Data Box
80 TB	173 days	78 days	8 days	19 hours	Use Data Box Heavy
100 TB	216 days	97 days	10 days	1 day	
200 TB	1 years	194 days	19 days	2 days	
500 TB	3 years	1 years	49 days	5 days	
1 PB	6 years	3 years	97 days	10 days	
2 PB	12 years	5 years	194 days	19 days	

Use a Data Box when data volume exceeds network capacity

Note: the table is based on 100% available network bandwidth

# Azure Data Box: offline transfer options

Available for small, medium, or large migrations

PRODUCTS	CAPACITY	DESCRIPTION
 Data Box Disk	8 TB, up to 40 TB	USB 3.1 SSD disks Order up to 5 in each pack
 Data Box	100 TB	Ruggedized, self-contained appliances
 Data Box Heavy	1 PB	

# Azure Data Box



## Fast and easy

Azure Data Box has 100TB of capacity, uses standard NAS protocols and common copy tools like Robocopy

## Safe and secure

Azure Data Box is tamper-resistant and ruggedized for shipping. Data is protected with AES 256-bit encryption for safe transit

## Partner supported

Azure Data Box is integrated with a global array of industry-leading Azure partners

## Availability: GA – US, EU, UK, AUS, CA, JP

Coming soon – US Gov

# Data Box—technical summary



Specification	Details
Storage capacity	100TB raw/~80TB usable
Data protection/security	AES 256-bit BitLocker encryption
Weight	~50 lbs/20 kg
Network interface	1x1/10 GbE RJ45 for management 1x1/10 GbE RJ45 and 2x10GbE SFP+ for data transfer
Access protocol	SMB/CIFS and NFS Azure Blob storage via REST API
Supported Azure storage types	Block Blob, Page Blob, Azure files and Managed Disk
Physical security	Tamper-evident ruggedized device casing
Power	110/240 (50/60 Hz)
Dimensions	17" H x 20" D x 12.2" W 43 cm x 51 cm x 31cm

# Azure Data Box Disk GA



## Simple to order and use

- You can easily order a pack(s) of up to five disks from the Azure portal for a total capacity of 40 TB per order.
- Each 8 TB SSD provides the right balance of capacity and portability to collect and transport data in a variety of use cases. Support is available for Windows and Linux.

## Fast data transfer

- These disks copy data at up to USB 3.1 speeds and support SATA II and III interfaces.
- Simply mount the disks as drives and use any tool of choice such as Robocopy, or just drag-and-drop to copy files to the disks.

## Security

- Disks are encrypted using AES 128-bit encryption and can be locked using custom passkeys.
- After data upload, disks are wiped clean in accordance with NIST 800-88r1 standard

## Generally Available in the US, EU, CA, AUS

Coming soon – JP, KR, US Gov

# Data Box Disk—technical summary



Specification	Details
Storage capacity	8TB raw/7 TB useable; up to five disks per order for 40TB raw/35TB useable total capacity
Data protection/security	AES 128-bit encryption & NIST 800-88r1 sanitization
Device connection	USB 3.1, SATA II or III
Media	2.5" Solid State Drive (SSD)
Supported OS	Windows (7,8,10), Windows Server (2008, 2012, 2016) Linux: CentOS 6.9+, RHEL 6.9+, Ubuntu 14+, Debian 8+
Supported Azure storage types*	Block Blob, Page Blob, Azure Files and Managed Disk
Power	No external power required
Dimensions (h/w/d)	Each - 0.4" x 2.8" x 4"

\* Currently valid for GPv1, GPv2 and Blob storage accounts

# Azure Data Box Heavy



**Lift massive data payloads into the cloud**

## **Simple to order and use**

Order Data Box Heavy from the Azure portal. It will be shipped via truck directly to your DC. For simplicity, it uses common copy tools like Robocopy

## **Large capacity**

Data Box Heavy lifts massive data payloads to Azure with its 1 PB data capacity

## **Safe and secure**

Data Box Heavy is tamper-resistant and ruggedized for shipping. Data is protected via AES 256-bit encryption for safe transit

## **Available – US, EU, UK**

Coming soon – CA, AUS, US Gov, JP

# Data Box Heavy—technical summary



Specification	Details
Storage capacity	1 PB raw/~800TB usable
Data protection/security	AES 256-bit BitLocker encryption
Weight	<500 lbs/227 kg
Network interface	2x1/10GbE RJ45 for management 4x40GbE QSFP+ for data transfer
Access protocol	SMB/CIFS and NFS Azure Blob Storage via the REST API
Supported Azure storage types	Block Blob, Page Blob, Azure Files and Managed Disk
Physical security	Tamper-evident ruggedized device casing
Power	110/240 (50/60 Hz)
Dimensions	27"H x 44"D x 26"W 69cm x 112cm x 66cm

# Data Box pricing for offline solutions

	Data Box		Data Box Disk		Data Box Heavy	
Location	US	EU <sup>1</sup>	US	EU <sup>1</sup>	US	EU <sup>1</sup>
Import service fee/ order processing fee	\$250	€215	\$50	€42	\$4,000	€1336
Daily Disk usage fee <sup>2</sup>			\$10	€8.5		
Extra day fee	\$15/day	€12/day			\$100	€43
Device shipping	\$95	€95	\$30	€30	~\$1,500 <sup>3</sup>	~€1,500 <sup>3</sup>

1. Euro prices based on current exchange rates and may vary

2. Daily Disk usage fee includes first three days as a grace period

3. Starting shipping price. May be higher depending on carrier, and shipping options

Data Box pricing currently in effect

# Data Box partners: more benefits

## The Azure Data Box partner page

- Validated solution partners can publish Data Box solutions, including a short value prop statement
- Publish links to your product details, solution briefs



<https://aka.ms/databoxpartners>



## Azure Data Box Partners

Accelerate your migrations to Azure with Data Box partner solutions designed to fit your needs



07/29/2019

Company Link	Solution Brief	Archive and Backup	Disaster Recovery	Data Mgmt. Services	Big Data	Media and Entertainment
<a href="#">Archive 360</a>	<a href="#">Archive 360</a>	•				
<a href="#">Automated AI Intelligence</a>	<a href="#">Automated Intelligence</a>			•		
<a href="#">Avid</a>	<a href="#">Avid</a>	•	•	•		•
<a href="#">Carbonite</a>	<a href="#">Carbonite</a>	•	•			
<a href="#">Cohesity</a>	<a href="#">Cohesity</a>	•				
<a href="#">Commvault</a>	<a href="#">Commvault</a>	•	•	•	•	
<a href="#">Datadobi</a>	<a href="#">Datadobi</a>	•				
<a href="#">Data Dynamics</a>	<a href="#">Data Dynamics</a>	•	•			
<a href="#">DefendX</a>	<a href="#">DefendX</a>	•				
<a href="#">Dicomatics</a>	<a href="#">Dicomatics</a>			•		
<a href="#">Health Catalyst</a>	<a href="#">Health Catalyst</a>	•				
<a href="#">Hubstor</a>	<a href="#">Hubstor</a>	•		•		
<a href="#">Interlake</a>	<a href="#">Interlake</a>					•
<a href="#">Peer Software</a>	<a href="#">Peer Software</a>			•		
<a href="#">Robin Systems</a>	<a href="#">Robin Systems</a>				•	
<a href="#">Rubrik</a>	<a href="#">Rubrik</a>	•				
<a href="#">Teradata</a>	<a href="#">Teradata</a>	•		•	•	
<a href="#">Veeam</a>	<a href="#">Veeam</a>	•				
<a href="#">WANdisco</a>	<a href="#">WANdisco</a>			•	•	
<a href="#">Zerto</a>	<a href="#">Zerto</a>				•	

# Azure Data Box family—summary

## OFFLINE DATA TRANSFER



### Data Box

- Capacity: 100 TB
- Weight: ~50 lbs.
- Secure, ruggedized appliance
- GA

**Data Box enables bulk migration to Azure when network isn't an option**



### Data Box Disk

- Capacity: 8TB ea.; 40TB/order
- Secure, ruggedized USB drives orderable in packs of 5 (up to 40TB)
- GA

**Perfect for projects that require a smaller form factor e.g., autonomous vehicles**



### Data Box Heavy

- Capacity: 1 PB
- Weight 500+ lbs.
- Secure, ruggedized appliance
- GA

**Same service as Data Box, but targeted to petabyte-sized datasets**

## ONLINE DATA TRANSFER



### Data Box Gateway

- Virtual device provisioned in your hypervisor
- Supports storage gateway, SMB, NFS, Azure blob, files
- GA

**Virtual network transfer appliance (VM), runs on your choice of hardware**



### Data Box Edge

- Local Cache Capacity: ~12 TB
- Includes Data Box Gateway and Azure IoT Edge
- GA

**Data Box Edge manages uploads to Azure and can pre-process data prior to upload**



ORDER



SEND



FILL



RETURN



UPLOAD



CLOUD TO EDGE



EDGE TO CLOUD



PRE-PROCESSING



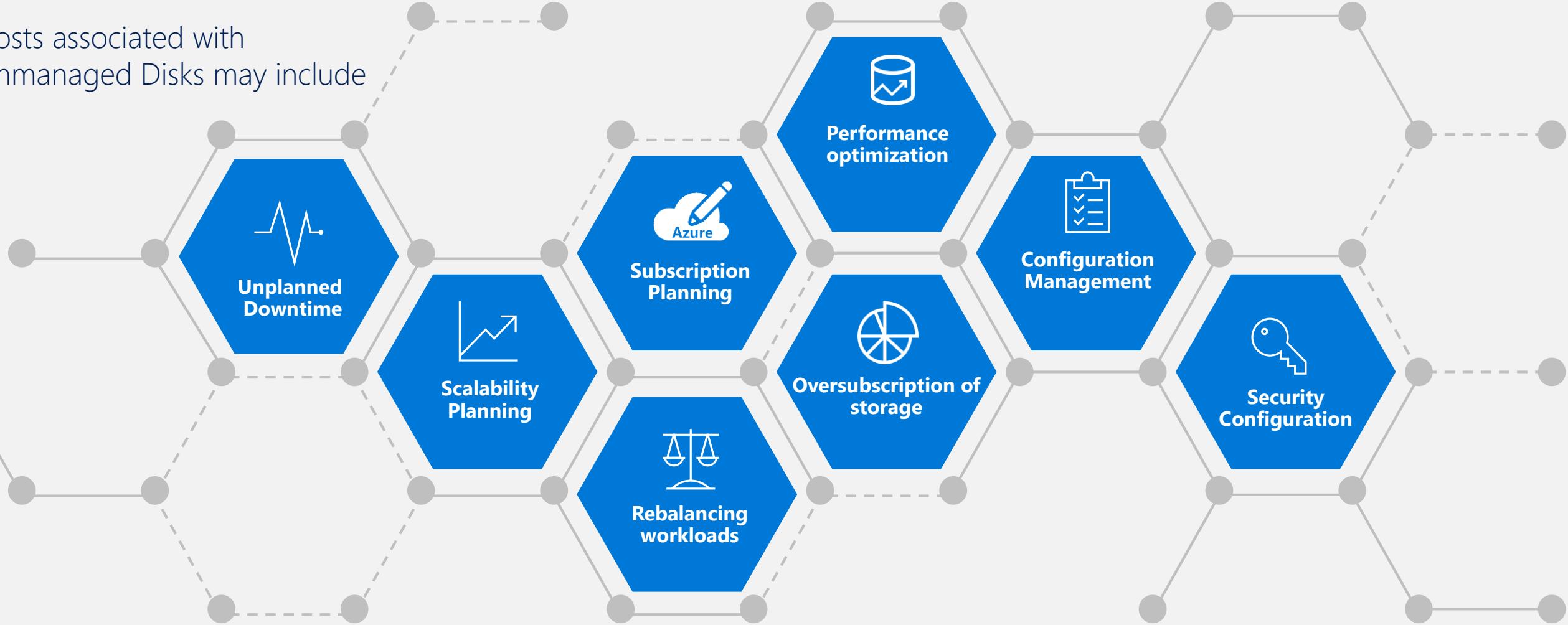
Edge Compute

ML INFERRING

# Tools and Best Practices

# Realize the benefits by eliminating operational costs associated with Unmanaged Disks

Costs associated with Unmanaged Disks may include

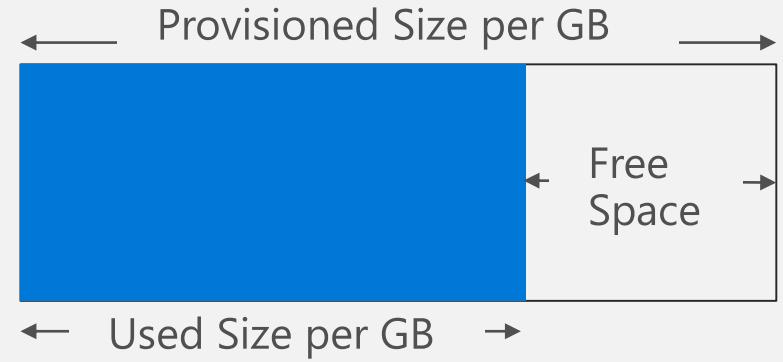


# Billing Models for Persistent Disks

## Provisioned Size Cost Model

Used by:

- Azure Premium Unmanaged Disks
- Azure Premium Managed Disks
- Azure Standard Managed Disks
- Other Cloud Platforms



## Consumed Size Cost Model

Used by:

- Azure Standard Unmanaged Disks

# Disks - Best Practices

Always use Premium Disks for Production workloads

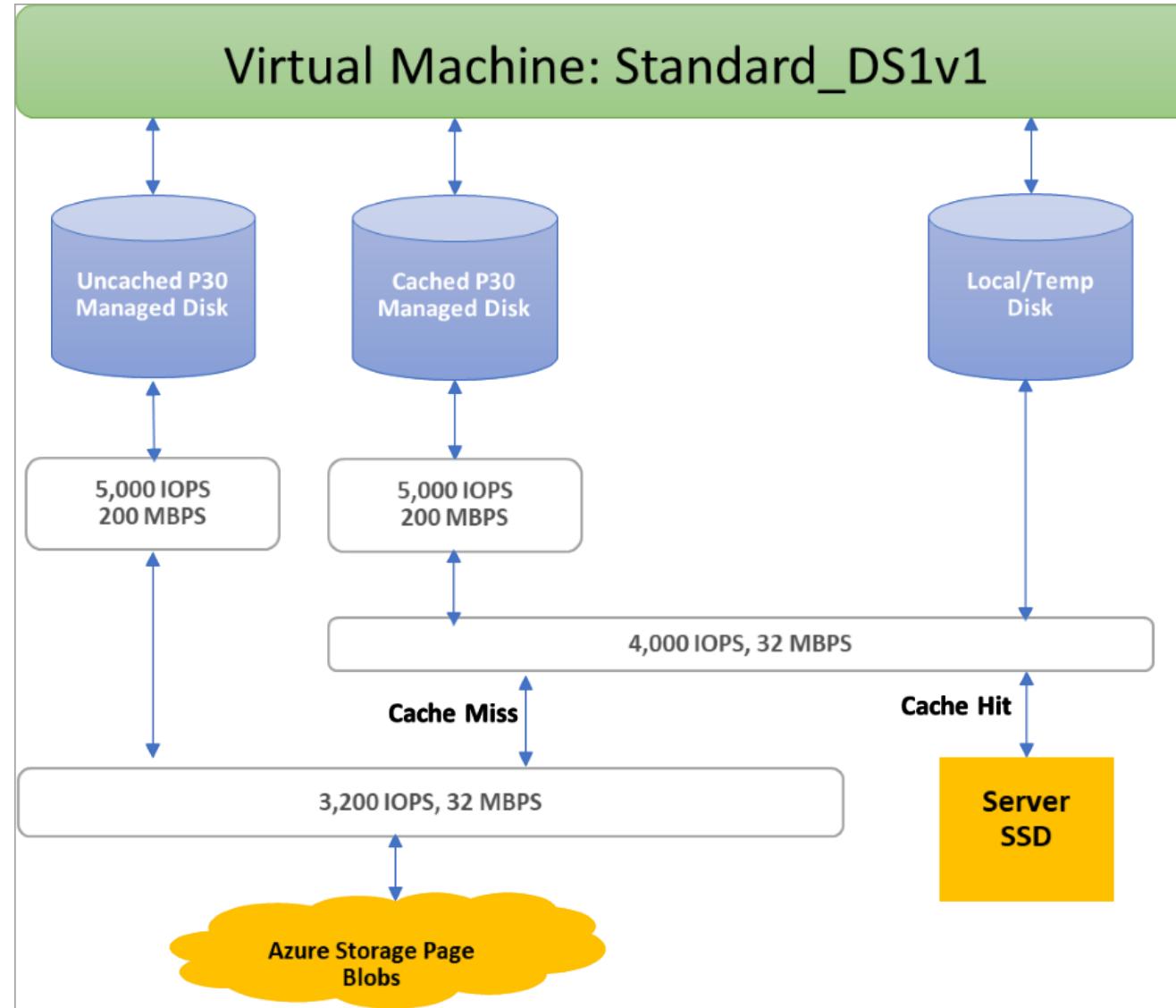
RAID for redundancy is not necessary

- RAID for performance as needed
- Durability doesn't remove the need for backups

Performance

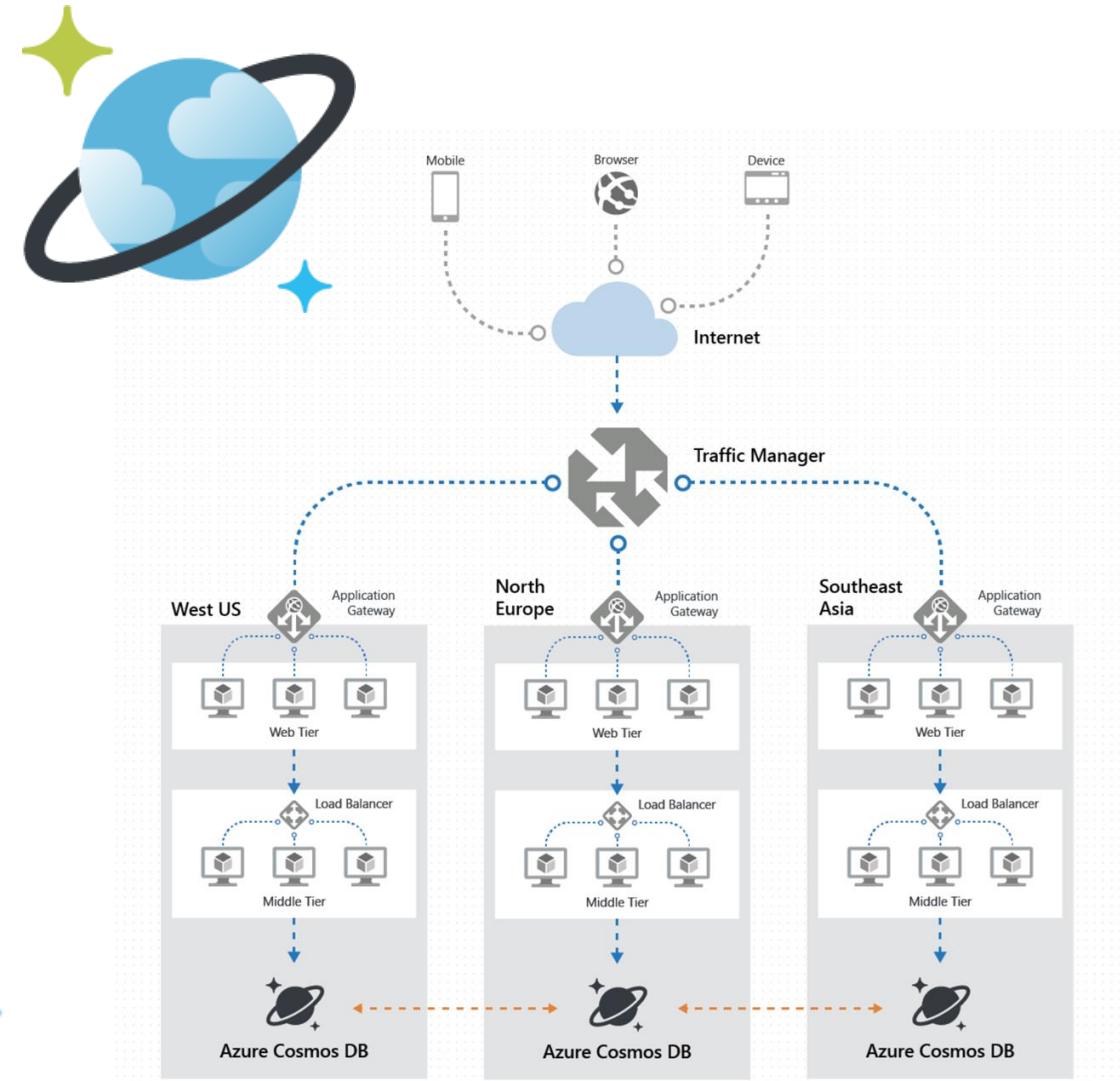
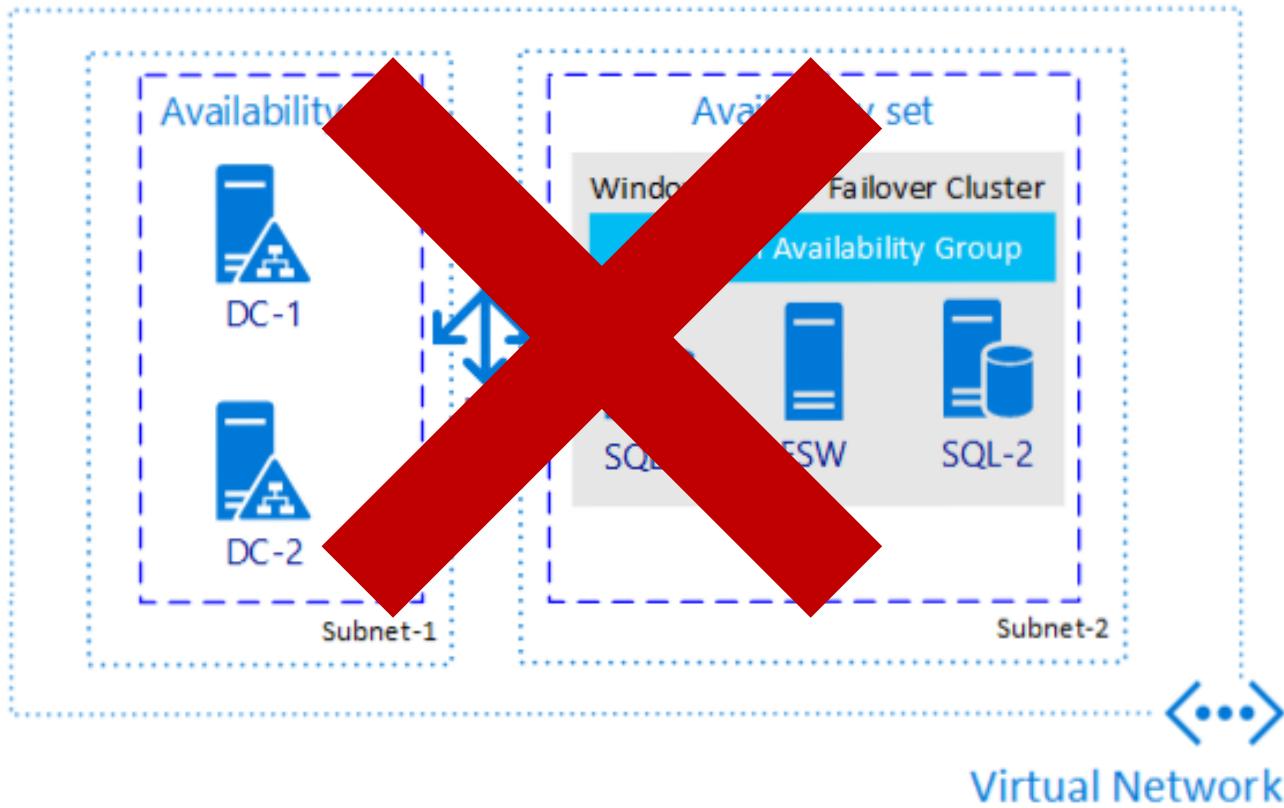
- Local ssd is **definitely** temporary, use if you can tolerate loss
- Enable read caching where appropriate for better performance
- Understand VM limits vs Disk limits for performance

# Disk Allocation and Performance



# Global Distribution vs BCDR

RA-GRS is not Global Read/Write



# Azure Storage Explorer

## Easy Storage Management

Create, delete, view, and edit resources in Azure Storage, Azure Cosmos DB, and Data Lake Storage.

## Powerful Experience

Seamlessly view, search, and interact with your data and resources

## Online or Off

Work disconnected from the cloud or offline with local emulators

## Secure

Use the full range of Azure security features, including role-based access control, Azure Active Directory, and connection strings, to connect and manage your Azure resources—always over HTTPS

The screenshot shows the Azure Storage Explorer interface. On the left is the 'EXPLORER' sidebar with a tree view of storage resources, including 'Local & Attached', 'Internal Consumption', 'Storage Accounts' (with blobs, containers, shares, queues, and tables), and 'Tables' (with specific metrics tables like '\$MetricsCapacityBlob', '\$MetricsHourPrimaryTransactionsBlob', etc.). The main area displays a table titled '\$MetricsHourPrimaryTransactionsBlob'. The table has columns: PartitionKey, RowKey, Timestamp, AnonymousAuthorizationError, AnonymousClientOtherError, and AnonymousClientTi. The table lists 100 items from August 7, 2019, to August 7, 2019, with various user and system entries. At the bottom, there are 'Actions' and 'Properties' tabs for the selected table, and an 'Activities' section showing 'Clear completed' and 'Clear successful' buttons.

PartitionKey	RowKey	Timestamp	AnonymousAuthorizationError	AnonymousClientOtherError	AnonymousClientTi
20190807T1200	system;All	2019-08-07T13:23:18.906Z	0	0	0
20190807T1200	user;All	2019-08-07T13:23:00.262Z	0	0	0
20190807T1200	user;GetBlobServiceProperties	2019-08-07T13:23:00.262Z	0	0	0
20190807T1300	user;All	2019-08-07T14:23:24.965Z	0	0	0
20190807T1400	system;All	2019-08-07T14:23:24.969Z	0	0	0
20190807T1400	user;All	2019-08-07T15:59:56.992Z	0	0	0
20190807T1500	system;All	2019-08-07T16:22:11.879Z	0	0	0
20190807T1500	user;All	2019-08-07T16:22:11.884Z	0	0	0
20190807T1600	user;All	2019-08-07T17:21:06.547Z	0	0	0
20190807T1600	system;All	2019-08-07T17:21:37.242Z	0	0	0
20190807T1600	user;GetBlobServiceProperties	2019-08-07T17:21:06.546Z	0	0	0
20190807T1700	user;All	2019-08-07T18:23:46.057Z	0	0	0
20190807T1700	system;All	2019-08-07T18:23:46.059Z	0	0	0
20190807T1800	user;All	2019-08-07T19:20:58.332Z	0	0	0
20190807T1800	system;All	2019-08-07T19:20:58.334Z	0	0	0
20190807T1900	user;All	2019-08-07T20:24:26.560Z	0	0	0
20190807T1900	system;All	2019-08-07T20:24:26.562Z	0	0	0
20190807T2000	user;GetBlobServiceProperties	2019-08-07T21:21:46.345Z	0	0	0
20190807T2000	system;All	2019-08-07T21:22:13.415Z	0	0	0
20190807T2000	user;All	2019-08-07T21:21:46.345Z	0	0	0
20190807T2100	user;All	2019-08-07T22:21:26.186Z	0	0	0
20190807T2100	system;All	2019-08-07T22:21:26.191Z	0	0	0

# AZCopy

C:\WINDOWS\system32\cmd.exe

Usage:  
azcopy [command]

Available Commands:

copy	Copies source data to a destination location
env	Shows the environment variables that can configure AzCopy's behavior
help	Help about any command
jobs	Sub-commands related to managing jobs
list	List the entities in a given resource
login	Log in to Azure Active Directory to access Azure Storage resources.
logout	Log out to terminate access to Azure Storage resources.
make	Create a container/share/filesystem
remove	Delete entities from Azure Storage Blob/File/ADLS Gen2
sync	Replicate source to the destination location

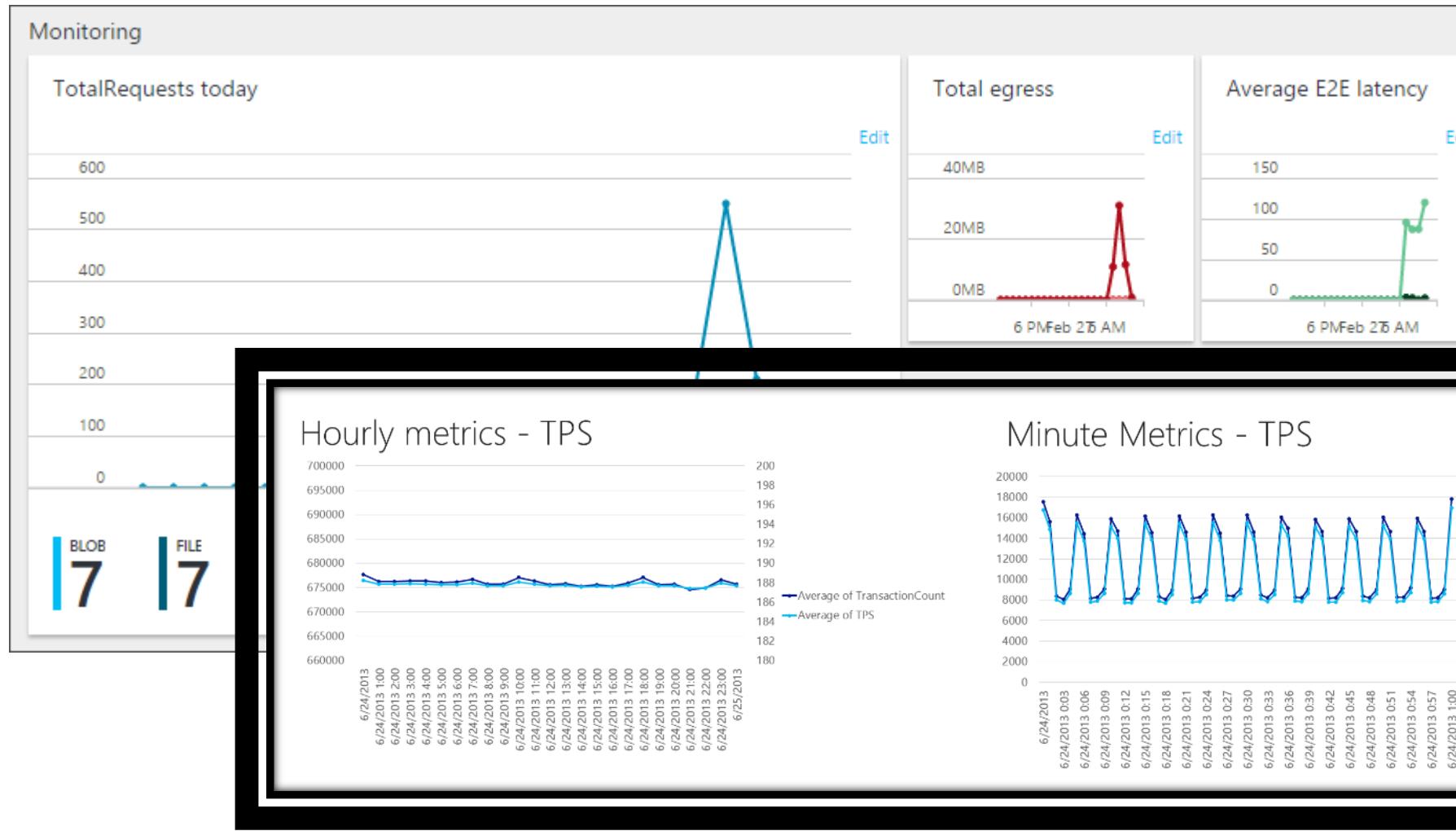
Flags:

--cap-mbps uint32	caps the transfer rate, in Mega bits per second. Moment-by-moment throughput may vary slightly from the cap. If zero or omitted, throughput is not capped.
-h, --help	help for azcopy
--output-type string	format of the command's output, the choices include: text, json. (default "text")
--version	version for azcopy

Use "azcopy [command] --help" for more information about a command.

AKA.MS/AZCopy

# Monitoring



Add rule

\* Name

Description

Source  
Alert on

Criteria

Subscription

Resource group

Resource

\* Metric

No data to display

Condition

\* Threshold

Period

Notify via

Email owners, contributors, and readers

Additional administrator email(s)

Webhook

Learn more about configuring webhooks

Take action

OK

